Race, Rather than Skin Pigmentation, Predicts Facial Hair Growth in Women

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ABSTRACT

Background: The Ferriman-Gallwey hirsutism score is the currently accepted standard for assessing excess hair growth that may indicate hyperandrogenicity. The score was originally based on 60 Caucasian women, and recent studies suggest that it may need modification to be used in other populations. **Objectives:** To investigate ethnic, racial, and pigmentary variations in hair growth of the upper lip in diverse multinational populations. **Results:** Variations in hair growth of the upper lip were significantly related to self-reported ethnicity and race. In a logistic regression with racial groups and skin lightness, all racial groupings (African American, Hispanic, Asian Indian, and East Asian) were predictive of hair growth (all $p<0.0001$), but skin lightness was not (all $p>0.05$). **Conclusion:** The observed differences in constitutive hair growth illustrate the need to develop an ethnically stratified visual scoring method to more accurately characterize the severity of excess hair growth. (*J Clin Aesthet Dermatol.* 2014;7(5):24–26.)

Hirsutism is characterized by excessive terminal hair growth in a characteristically male pattern and can be a cutaneous manifestation of hyperandrogenism.[1,2] Hyperandrogenism can be caused by conditions, such as polycystic ovary syndrome, nonclassic adrenal hyperplasia, adrenal tumors, and ovarian tumors.[3] The primary scale to evaluate hirsutism is the Ferriman-Gallwey visual scoring scale, which involves the visual scoring of hair growth in nine androgen-dependent areas of the body.[4] The Ferriman-Gallwey method was based on a predominantly white population, and may not reflect ethnic and racial variations in normal hair growth.[5] While modified scoring systems have acknowledged ethnicity as important in the clinical evaluation of hirsutism, none to date have integrated ethnic differences into the actual scoring system nor evaluated the role of underlying skin pigmentation as a modifying factor.[6]

It has been proposed that ethnicity and race may predict normal patterns of hair growth, which may have implications for the classification of hirsutism.[1] Studies examining ethnic variations in hair growth are few, have been limited in scope, and have yielded inconclusive results.[7,8] The present analysis was designed to determine whether constitutive Ferriman-Gallwey scores of the lip, which has the highest score for androgen sensitivity,[9] was consistent across different ethnic, racial, and pigmentation groups in a healthy population.

METHODS

As previously described, a data set consisting of high-resolution standardized digital images of the left side of the faces of 2,895 women of five racial groups was analyzed. The women were recruited from the general population in four different cities—Los Angeles, USA; London, England; Rome, Italy; and Akita, Japan. A worldwide sample was obtained in order to maximize the recruitment of different ethnic groups. In Los Angeles, participants were recruited from a shopping mall in an ethnically diverse neighborhood. In the other three cities, subjects were recruited through advertising. The study was conducted from November to February to minimize the effect of

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TABLE 1. Method of Ferriman-Gallwey (mFG) scores of study participants

mFG SCORE	CAUCASIAN	ASIAN INDIAN	AFRICAN AMERICAN	HISPANIC	JAPANESE	EAST ASIAN
0	78%	43%	62%	52%	76%	46%
1	16%	44%	30%	36%	23%	47%
2	5%	11%	7%	11%	1%	7%
3	0%	2%	1%	0%	0%	0%
4	0%	0%	0%	0%	0%	0%

tanning. This study was reviewed and approved by the Partners Institutional Review Board. Informed consent was obtained from all participants.

Racial group, ethnicity, and age were determined by subject self-report. Mean age did not differ significantly between the ethnic groups studied. Scoring of the upper lip was done according to the method of Ferriman-Gallwey (mFG scoring)[4]; a grade of 0 indicated no hair; 1, a few hairs at the outer margin; 2, a small moustache at the outer edge of the lip; 3, a moustache extending halfway from the outer margin of the lip; and 4, a moustache extending to the midline of the lip (Table 1). The Chromameter CR200 (Konica Minolta, Ramsey, New Jersey) was used to measure color (L*a*b*) of skin on the cheek, forehead, and upper inner arm. A single judge graded the images blinded to all patient data other than subject number. The data was analyzed using chi square (x), t Test (t), analysis of variance–ANOVA (f), and logistic regression.

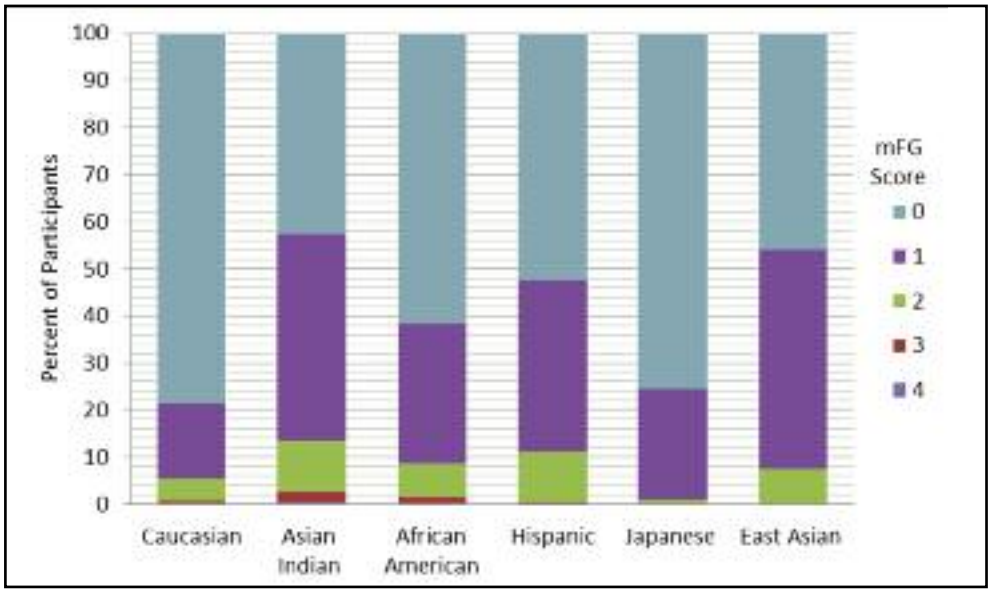

Figure 1. Frequency of Ferriman-Gallwey scores of the upper lip by self-reported race

RESULTS

There were significant racial differences in hair growth and color of the upper lip, with Indian women having more hair growth than any other race (all $p<0.01$) and Caucasian women having less than any other race (all $p<0.009$) (Figure 1). When analyzed by ethnicity, Japanese women had significantly less hair growth than East Asian American women (x=41, $p<0.001$), and Caucasian Italian women had significantly more hair growth than Caucasian British or American women (x=35, 21, $p<0.0001$, respectively). Hair growth of the upper lip was related to skin lightness (L*-value). Those with hair growth had darker skin of the forehead (t=7.6, $p=0.0000$), cheek (t=4.9, $p<0.00001$), and inner arm (t=3.1, $p=0.002$). In a logistic regression with racial groups and skin lightness, all racial groupings (African American, Hispanic, Asian Indian, and East Asian) were predictive of hair growth (all $p<0.0001$), but skin lightness was not (all $p>0.05$).

DISCUSSION

This study demonstrated that while race was predictive of hair growth intensity, skin pigmentation was not. Previous research has also shown a poor correlation between objective measures of pigmentation and race, but it has been unknown which was the primary driver in facial hair color.[10] One major advantage of this study over existing literature on ethnic differences in hair growth is the

standardized measurement of multiple races at once and the quantitative comparison with constitutive skin color. Moreover, this study included recruitment from the general population rather than only individuals presenting for evaluation of excess hair growth.

Limitations of this analysis include the fact that although shaved or depilated hair could be visually scored, hair that was waxed or threaded may not have been visible, thus underestimating hair growth severity. White vellus hairs could be visualized on light skin types. It is possible that this population included some women with hyperandrogenism, although incidence would be expected to be similar across all the groups. This sample provides evidence for ethnic and racial variations in hair growth; however, the results of this study are limited by the examination of facial hair growth. As the Ferriman-Gallwey method involves the scoring of hair growth on nine body areas, future research could investigate whether ethnic variations are also present in other androgen-dependent areas of hair growth.

This work has some additional implications. Moving toward a better evaluation of hirsutism may help clarify the underlying etiology of idiopathic hirsutism. Idiopathic hirsutism is a diagnosis of exclusion, referring to the presentation of hirsutism without androgen excess and with normal ovarian function.[5] The potential misdiagnosis of hirsutism in women whose hair growth is within the normal variations of their racial group, using the current scoring methods, may bias the sample of individuals evaluated for hirsutism or diagnosed with idiopathic hirsutism.

As an additional note, the observed ethnic variations in constitutive hair growth also highlight the need for continuing to develop safe and effective laser hair removal systems for all skin types. Given the advent of long-pulsed diode and neodymium-doped yttrium aluminum garnet (Nd:YAG)-wavelength based laser systems, laser hair removal can be safely employed across all Fitzpatrick skin types.[11] However, there are no currently marketed home laser hair removal devices approved for use in individuals with Fitzpatrick skin types V to VI, and inappropriate use of available devices carries the risk of thermal skin damage.

In summary, this study describes ethnic variability in female upper lip hair growth, setting the stage for future investigation into how the relationship between mFG score and other markers of hyperandrogenism, such as serum testosterone, vary by ethnicity. A better understanding of the ethnic variability in constitutive hair growth may be valuable to clinicians deciding when to pursue an endocrine workup for patients presenting with excess hair growth.

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